

STOCKING DECISIONS: THEY MAKE OR BREAK YOU

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Decisions on species and variety of forage to plant and manage are economically critical because it establishes the potential to meet a particular production goal. However, the stocking rate used to graze these forages is more critical because it ultimately determines if a targeted level of production is reached. Most cattlemen aim for a stocking rate that provides maximum economic return, but it should be emphasized that an economically optimum stocking rate is one that potentially provides sustained economic return. It is obvious that dollar return is not maximized if excessive heavy grazing results in costly pasture renovation, ranging from 15.00 to 120.00 dollars/acre. Therefore, the challenge is to set stocking rates that meet product goals, adjust stocking rates during adverse weather patterns, and follow pasture management practices that match the intensity that pastures are grazed (heavy grazing requires higher inputs of management!). This paper will discuss factors in setting stocking rates (species/varieties of forages, stocking rate effects on weight gain, climate and forage growth distribution), and having contingency plans for adjusting stocking rates in response to dry weather patterns.

Factors in Setting Stocking Rates

The economically optimum stocking rate for a given pasture is heavily dependent on the forage species and variety to be grazed. To reduce risk of losing forage stands with intensively managed grazing systems, it is important that the forage species/variety is well adapted to the soils and climate. Forage species less suitable to a given set of conditions will require higher inputs of management (fertilization, irrigation, controlled grazing, etc.) to improve their persistence under moderate to heavy grazing intensities. Extension specialists and agents should be consulted to match pasture conditions with an adapted species/variety. Other forages with greater quality or yield potential can be considered over more adapted ones if it is feasible and practical to manage these less adapted species or varieties.

Forage species/varieties differ in their grazing tolerances and carrying capacities (number of cattle a pasture will hold when optimally grazed), but animal weight gain will follow similar trends as stocking rate increases. Figure 1 shows general trends in average daily gain (ADG) and weight gain per acre as stocking rate increases. Average daily gain will be highest and stable over a narrow range of low stocking rates that allows forage to accumulate. These stocking rates are extremely low and of little

economic value for most cattle operations. Beyond a critical stocking rate, ADG declines with increases in stocking rate and reductions in forage supply. The more economically relevant measure, weight gain per acre, gradually increases as ADG declines because additional animals compensate for the losses in individual animal gain (Fig. 1). Weight gain per acre will reach a maximum and then start to decline with further decreases in ADG. Obviously, these stocking rates should be avoided because ADG would likely be too low to pay for animal handling costs and negative profit margins. Furthermore, the economically sustainable stocking rate will be slightly less than the rate for maximum production per acre. The approach with a new forage or pasture is to either set initial rates conservatively low and adjust up, or have the capability to move cattle (or fortitude to sell!).

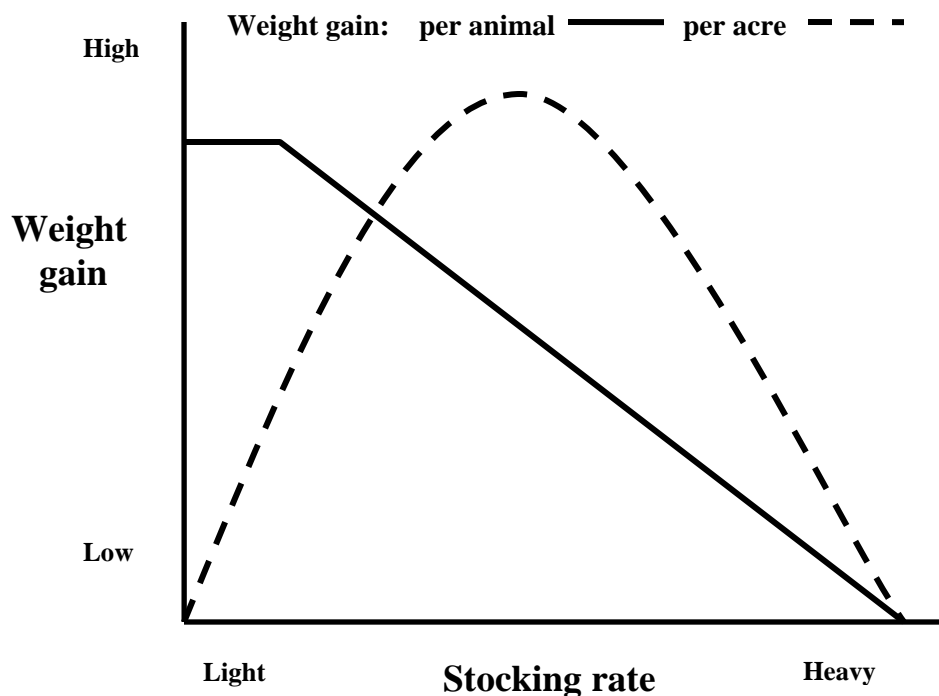


Fig. 1. Relationship between stocking rate and average daily gain and weight gain per acre (adapted from Jones and Sandland, 1974).

Decreasing weight gains with increases in stocking rates is typical across species and varieties, but the rates of change in ADG as grazing increases will vary considerably. Figure 2 illustrates how high-quality, upright growing grasses typically provide high ADG (>2.0 lb/day), but will show rapid declines in animal performance with increases in stocking rate. This group comprises cool-season perennials and annuals, and warm-season annuals. Sod-forming perennial warm-season grasses, with moderate to low quality, typically provide ranges of 1 to 2 lb ADG. Decline in ADG as stocking increases will be less with these grasses than with the upright growing cool- and warm-season grasses because they produce lateral growth that allows them to have greater growth with heavier grazing. Endophyte-infected tall fescue is an exception because alkaloids produced by the endophyte serve as an anti-quality factor causing substantial reductions in forage intake. As a result, the grass provides extremely high carrying capacity, but with very low ADG (< 1.0 lb/day).

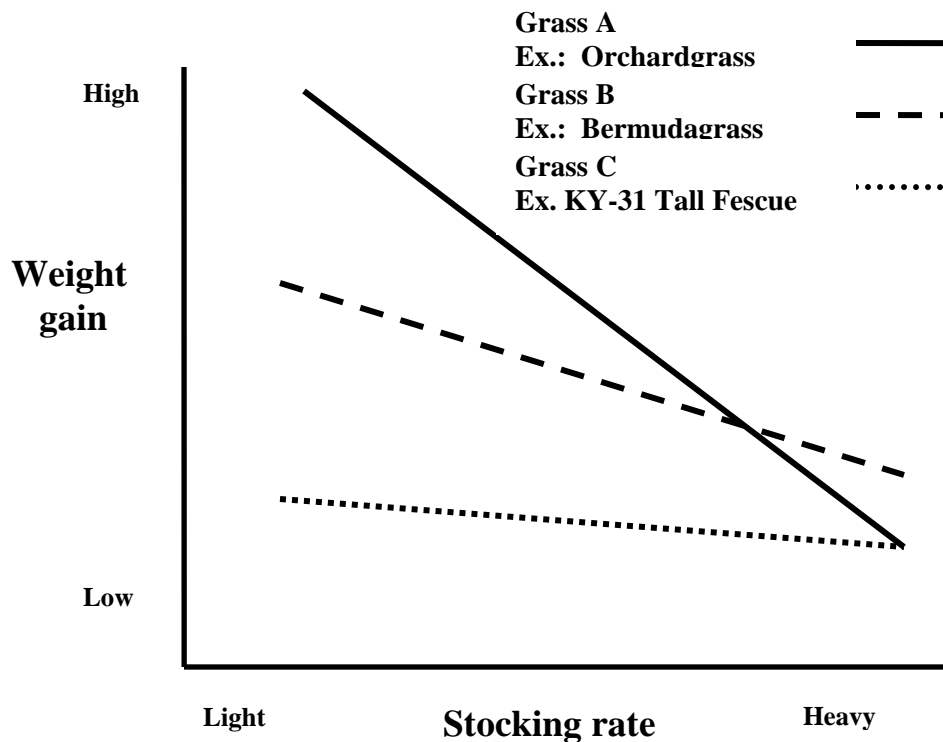


Fig. 2. Hypothetical relationships between stocking rate and average daily gain for three grasses that vary in tolerance to grazing and pasture carrying capacity.

It is important that cattlemen understand how their pasture forage grows and recovers over a range of stocking rates and weather patterns. It might take a number of growing seasons, but it should be a goal to have a clear visual impression of the grazing intensity and pasture condition needed for an economically optimum stocking rate. This comes with knowledge, experience, and working with extension specialists and agents.

Seasonal growth and weather patterns vary, which causes fluctuations in pasture carrying capacity. The conservative approach with the least amount of risk is to set stocking rates based on forage production during periods of low growth (cool-season perennial grasses during July and August). Forage accumulates rapidly during periods of active growth, but can be either cut for hay or stockpiled for later consumption during periods of low forage growth. A disadvantage to this approach is that stocking rates are likely less than the economically optimum during active forage growth, but an advantage is that periodic accumulation of forage would encourage healthy stands with strong, robust root systems and help to control weeds (assuming weeds are already under control). Another approach is to set stocking rates for high utilization during periods of rapid growth and rely on rotational stocking and provide hay and concentrate feeding, if needed, during periods of low growth. This allows economically optimum stocking rates during periods of higher forage production when pasture carry capacity is at its highest, but rotational stocking and feeding management are strongly recommended to reduce risk of inducing severe pasture deterioration during reduced forage growth.

Heavy grazing intensities inevitably occur sometime, even with economically optimum stocking rates, and increase risks of weakened stands and weed encroachment. These risks are reduced with a rotational system that provides sufficient pasture growth and recovery. Furthermore, ADG with heavy stocking can be increased through steady movement of cattle onto fresh regrowth.

Contingencies for Adjusting Stocking Rates

No matter the grazing system, drought conditions can weaken grass stands under moderate to heavy grazing intensities. The problem is that grazing intensities can change quickly during periods of drought. Moderate to heavy stocking rates can rapidly become excessive in a time that depends on soil moisture prior to onset of dry weather, soil moisture holding capacity, and tolerance of the pasture forage to drought.

Preparedness is the key to surviving a drought with a healthy pasture and herd. One recommendation is to sell early before pastures growth ceases and no rainfall is in the distant forecast. This is one of those, “Easier said than done,” types of recommendations; however, it can be done with a plan in place. A certain number of culls can be identified (everyone has them!) for selling before a drought pattern sets in and causes cattle markets to “bottom out”. A typical regret is to wait for cattle markets to rise during, or soon after, a drought. It doesn’t happen in severe drought situations! Selling early will therefore prove to be a sound business decision. A conservative approach can be taken by selling a small group to provide some relief without serious

herd reduction, but have a second group identified for dispersal if long-term drought is inevitable.

Another plan is to have a smaller pasture set aside to provide complimentary grazing. This pasture can contain high-quality forage, such as alfalfa, that is not part of the rotation but is available as needed. It can be used for either creep grazing, hay, or can be placed in the rotation to provide extra grazing and extend the growth and recovery periods for paddocks used in the normal rotation.

It goes without saying that soil fertility must be maintained with an intensively managed forage system, but risk of thinning stands during dry weather patterns will be less with adequate fertility going into drought patterns. Productive stands can withstand drought conditions, within limits, and not require replanting. However, following dry weather and prior to active growth, fertilization and weed control usually will be needed to strengthen stands and accelerate to their desired production level.

Summary

Stocking rates for intensive grazing systems are set to reach production goals, but these goals should be realistic so that pasture vigor and growth is sustained. A key to intensive grazing is to select adapted forage species and varieties, and to fully understand how the pasture forage reacts to grazing. Stocking rates are set based on expected forage availability during either active or inactive periods of forage growth. Intensive grazing systems often maximize utilization during active growth periods, but cattlemen must be prepared to adjust stocking rates or provide hay and feed during inactive growth periods. Intensive grazing requires rotational stocking and fertilization to maintain pasture productivity and reduce need for costly pasture renovation. Preparedness for drought conditions is necessary to minimize pasture deterioration from long-term excessive grazing.

References

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